FIG. 1

1 HEAD END PROCESSOR FOR TV, VOICE AND DATA SIGNALS

2 EXTERNAL TV CHANNELS

3 COMMUNICATION CHANNEL

4 VOICE & DATA CHANNEL

6 MIXER

7

8

9

10 FREQUENCY SPLITER

16 FORWARD

17 RETURN

POWER AMPLIFIER

ONLY RECEPTION

11 SUB-BAND SELECTOR

12 VOICE OR DATA SELECTOR

18

ONLY TRANSMITION

90 ENCODER TO VGA TO TV CONVERTER *

5 CPU TERMINAL

LOCAL

13 PBX

15 LOCAL TELEPHON NETWORK

14 PUBLIC TELEPHONE NETWORK

19 DATA PROCESSING

20 CPU

ADMINISTRATION

21 REMOTE MODULE UNIT

22 TV

32

33

91 R.F. CHANNEL FOR PCM

* THE EQUIPMENT IS NORMALLY INTEGRATED IN CPU TERMINAL

FIG. 2

VOICE / DATA CHANNEL

4

TO MIXER → 6

36 VOICE / DATA CHANNEL GENERATOR

37 PCM GENERATOR

38 CLOCK

35 VOICE TO DATA CONVERTER PAM
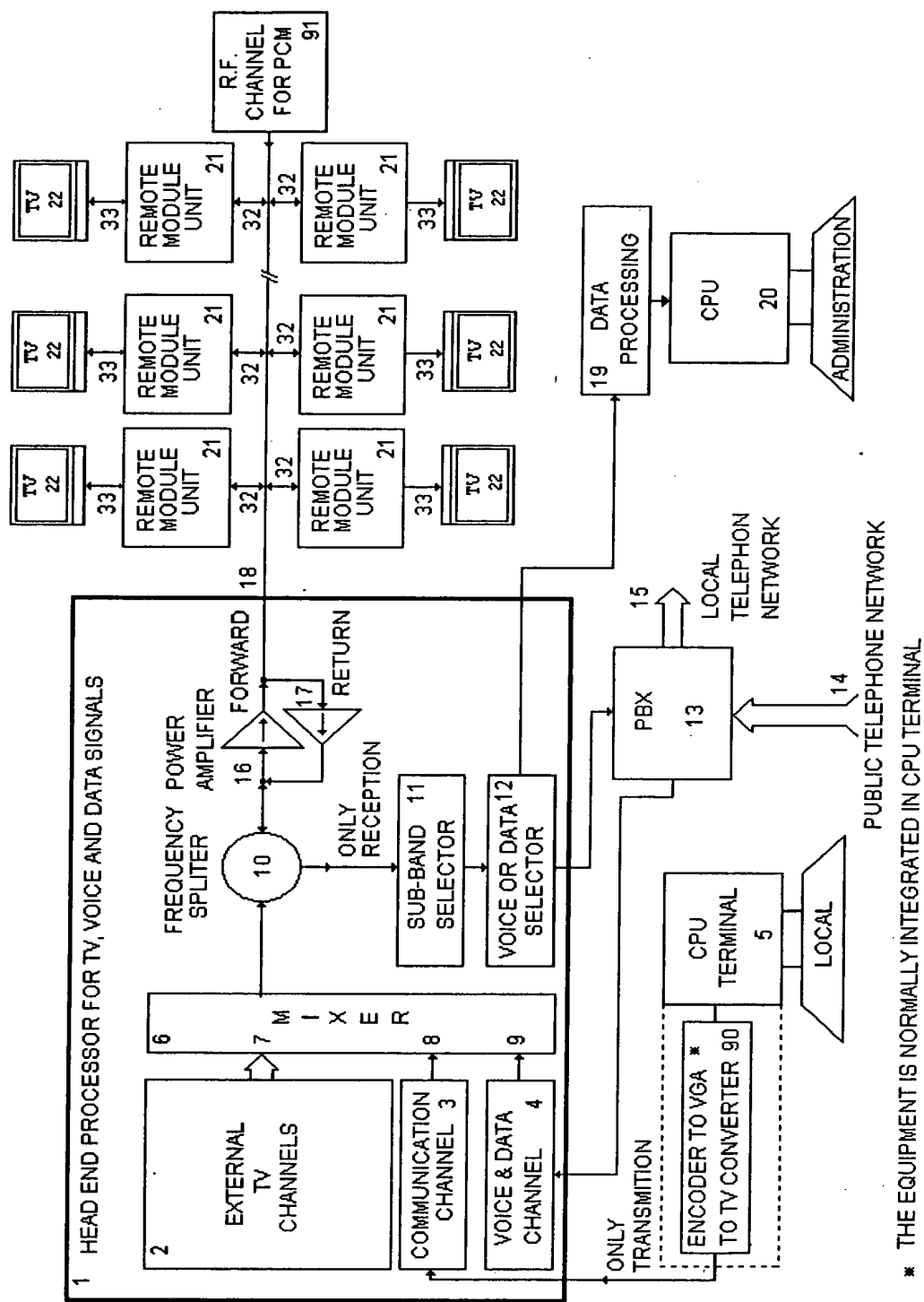
39 MULTIPLEXER

Nⁿ INPUTS FROM PBX 13 ONLY RECEPTION

FIG. 3

INFORMATION FORMAT FOR EACH ONE OF THE 10 LINES IN FIRST PLACE

FIG. 4
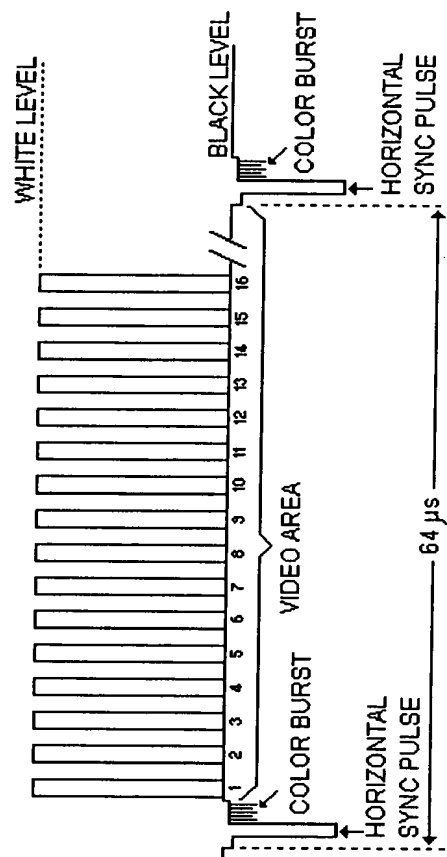
BITS PATTERN OF LINE 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

A ⎧————————————⎫ B ⎧————⎫ C ⎧——⎫
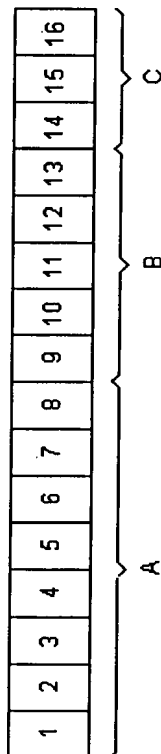
A = 8 BITS TO DEFINE EACH PCM UNITARY MODULE (FOR DATA)

B = 5 BITS FOR GENERAL INFORMATION.
(UP TO 3 DIFFERENTS PAGES WITH INFORMATION)
FIRST 3 BITS DEFINE THE FORMAT, NEXT 2 BITS DEFINE NUMBER OF PAGES

C = 3 BITS TO DEFINE NUMBER OF PAGES OF DATA CHANNEL

FIG. 5

BITS SHAPE OF LINES 2 TO 10

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

A
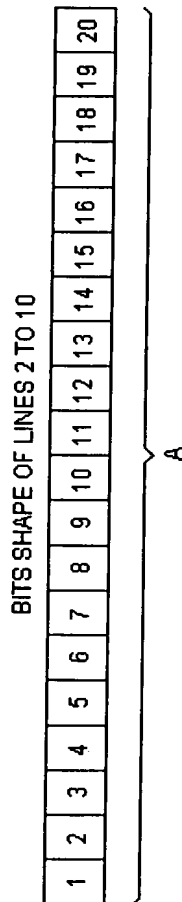
A = MAXIMUN QUANTITY OF BITS PER LINE ACCORDANCE TO ACTUAL PROGRAM
EVERY LINE IT IS USE FOR TO WRITE THE NUMBER OF CHANNELS, EACH ONE
NUMBER DEFINE IF THE CHANNEL WILL BE OPEN, IS IT REQUESTED

LINE 2 = LIST OF CHANNEL BASIC

LINE 3 = LIST OF PPV CHANNELS

LINE 4 = LIST OF SPECIAL EVENTS CHANNELS

LINE 5 = LIST OF ADDITIONAL CHANNELS

LINE 6 TO 10, ARE USE FOR TO SCRABBLE CHANNELS

FIG. 6

FRONT VIEW

21
23 CHANNEL ◆ PAGES
24 25
26 5

22

33

REAR VIEW

CABLE TV PHONE ALARMS
IN OUT IN
27 28 29 31 30

34 35

SPLITTER
18 18
DISTRIBUTION NETWORK
32

FIG. 7

RF INPUT
NETWORK
27

40 TUNER TV
CHANNEL

IR
REMOTE
23

41 INFRARED
DETECTOR

UP

CHANNELS
24

DOWN

26 CHANNEL
DISPLAY

42 TUNER
DATA
CHANNEL

VIDEO

N/A

AUDIO

43 SYNCHRONOUS
GENERATOR

44 SYNCHRONOUS
SEPARATOR

46 VIDEO / AUDIO
INPUTS (2)
SWITCH

VIDEO BB   N/C

47 SYNCRONOUS
& VIDEO MIXER

48 RAM

49 CPU
PROGRAM
CONTROL

V

A

OUTPUT
TUNER
CHANNELS
3 / 4   50

OUTPUT
TO
TV
28

UP

25

DOWN

CONTROL
PAGES

FIG. 8

OUTPUT TUNER CHANNELS 3/4 50

OUTPUT TO TV 28

V

A

VIDEO/AUDIO INPUTS (2) SWITCH 46

VIDEO BB N/C

VIDEO   N/A   AUDIO

SYNCRONOUS & VIDEO MIXER 47

FLASH RAM 48

CPU PROGRAM CONTROL 49

UP ↑

PAGES CONTROL 25

↓ DOWN

SYNCHRONOUS GENERATOR 43

SYNCHRONOUS SEPARATOR 44

A/D CONVERTER 45

TUNER TV CHANNEL 40

INFRARED DETECTOR 41

CHANNEL DISPLAY 26

TUNER DATA CHANNEL 42

RF INPUT NETWORK 27

IR REMOTE 23

UP ↑

CHANNELS 24

↓ DOWN

FIG. 9

VOICE DATA OUTPUT — 29

59 (VBAP) AUDIO CHANNEL PROCESSOR

64 CHANNEL SELECTOR FOR PCM

65 INPUT FOR AUDIO CHANNEL PROCESSING

29 INPUT VOICE DATA

67 MULTITONE GENERATOR (DTMF)

58 PULSE REGENERATION

63 OUTPUT UNITARY CHANNEL SELEC

66 ALARMS INPUT

57 INPUT CHANNEL SELECTOR

60 CLOCK

62 CHANNEL GENERATOR

TO BUZZ CIRCUIT

56 CHANNEL FILTER

61 BAND PASS FILTER

BI-DIRECTIONAL MIXER

55

EXT. NETWORK

27

FIG. 10

FROM
FREQUENCY
SPLITER 10

SUB-BAND SELECTOR

11

71
TUNER SELECTOR
SUB-BAND CHANNEL

72
SYNCRONOUS
SEPARATION

TO VOICE
OR DATA
SELECTOR 12

FIG. 11

VOICE OR DATA SELECTOR 12

FROM SUB-BANDA SELECTOR 11 →

UNITARY CHANNEL SELECTOR 75

PULSE REGENERATION 76

RAM MEMORY 78

MASTER CLOCK 77

CPU CONTROLLER 79

AUDIO CHANNEL PROCESSOR (VBAP) 80

CHANNEL PBX SELECTOR 82

PCM CHANNEL CONTROLLER 81

TO * PBX 13

TO * PCM 19

TO PBX * 13 DIGITAL INPUT

TO PBX * 19 DIGITAL INPUT

* THIS OUTPUT DEPENDS ON CONFIGURATION OF THE EXTERNAL EQUIPMENT

FIG. 12

DATA PROCESSING 19 *

FROM VOICE
AND DATA
SELECTOR 12

PULSE * 86
SHAPE
RECONSTRUCTION

RAM * 87

DATA * 88
CONTROLLER

TO CPU 20

* THESE CIRCUITS WOULD BE PART OF CPU TERMINAL (20)

FIG. 13

WHITE LEVEL

GRAY LEVELS

BLACK LEVEL

COLOR BURST

HORIZONTAL
SYNC PULSE

VIDEO AREA

64 µs

COLOR BURST

HORIZONTAL
SYNC PULSE

FIG. 14

21

26 DISPLAY CHANNEL

25

23 IR DET

24

← →   ← →

40 TUNNER CHANNEL

42 TUNNER DATA CHANNEL

50 OUTPUT TUNNER CHANNEL

POWER SUPLY

LINE TRANSF

D1 D2 D3 D4 REG

CAP CAP

Fig. 7/8

46 VIDEO & AUDIO SWITCH

49 CPU

44 SYNC SEP

48 RAM

48 RAM

45 A/D

47 SYNC & VIDEO MIX

43

Fig. 9

56 to 65

67 DTMF

64 PCM SEL

60 CLK

66 ALARMS

41 INFRARED & CONTROL DISPLAY

27 28 29 31 30

FIG. 15

RING CIRCUIT

FIG. 16

100
TEXT / IMAGE
RECEPTION
FLOW CHART

TUNER 42 RECEIVES
DATA ON
PRE-SELECTED
CHANNEL   105

GET HORIZONTAL
AND VERTICAL
SYNC INFORMATION
TO READ THE FIRST
SCAN LINE   110

GET SVS KEY
115

DOES
KEY MATCH
SVS MODULE
KEY ?
120

no

yes

READ BITS 9 TO 13
(IMAGE TYPE) AND
STORE IN RAM 48
125

READ BITS 14 TO 16
(NUMBER OF PAGES)
AND STORE IN RAM 48
130

READ SCANED LINES
135

STORE IMAGE IN
RAM 48   140

FIG. 17

```
                    ┌─────────────────┐
                    │      200        │
                    │   CHANNELS      │
                    │   DISPLAY       │
                    │  FLOW CHART     │
                    └────────┬────────┘
                             │
     ┌───────────────────────┤
     │                       ▼
     │            ┌────────────────────┐
     │            │  READ CHANNEL'S    │
     │            │  NUMBERS IN 4TH    │
     │            │  SCANNED LINE  205 │
     │            └─────────┬──────────┘
     │                      ▼
     │            ┌────────────────────┐
     │            │  STORE NUMBERS     │
     │            │  IN RAM 48         │
     │            │              210   │
     │            └─────────┬──────────┘
     │                      ▼
     │            ┌────────────────────┐
     │            │  TURN SVS ON   215 │
     │            └─────────┬──────────┘
     │                      ▼
     │            ┌────────────────────┐
     │            │  TUNER 40 STARTS ON│
     │            │  PRE-SELECTED      │
     │            │  CHANNEL      220  │
     │            └─────────┬──────────┘
     │         ┌────────────┤
     │         │            ▼
     │         │         ◇ IS
     │         │      CHANNEL
     │         │      NUMBER
     │         │   SELECTED BY ──── no ───┐
     │         │    TUNER 40 IN           │
     │         │     RAM 48 ?             │
     │         │       225                │
     │         │            │ yes         │
     │         │            ▼             │
     │         │  ┌────────────────────┐  │
     │         │  │  DISPLAY CHANNEL   │  │
     │         │  │              230   │  │
     │         │  └─────────┬──────────┘  │
     │         │            ▼             │
     │         │         ◇                │
     │         │      HAS THIS            │
     │  yes ───┤  CHANNEL NUMBER          │
     │         │      CHANGED ?           │
     │         │                          │
     │         │       235                │
     │                    │ no            │
     │            ┌────────▼──────────┐   │
     │            │  TURN SVS OFF     │   │
     │            │              240  │   │
     │            └────────┬──────────┘   │
     └─────────────────────┴──────────────┘
```

FIG. 18

```
          ┌──────────────────────┐
          │         300          │
          │  VOICE FROM  PBX     │
          │    FLOW CHART        │
          └──────────┬───────────┘
                     │
          ┌──────────▼───────────┐
          │    SEND PBX          │
          │  COMMUNICATIONS      │
          │  TO PCM SYSTEM   305 │
          └──────────┬───────────┘
                     │
          ┌──────────▼───────────┐
          │  SEND PCM SYSTEM     │
          │  OUTPUT THROUGH      │
          │    HEAD END      310 │
          └──────────┬───────────┘
                     │
          ┌──────────▼───────────┐
          │  SVS RECOGNIZES      │
          │  IT'S PCM SLOT   315 │
          └──────────┬───────────┘
                     │
                  ╱─────╲
                 ╱  IS   ╲           yes
                ◄ THE PHONE ►──────────┐
                 ╲  BUSY ?  ╱          │
                  ╲───────╱            │
                    320                │
                     │ no             │
          ┌──────────▼───────────┐    │
          │  LOCAL  RINGER       │    │
          │  IS ACTIVATED        │    │
          │  (CHANNEL ALARMS)    │    │
          │                  325 │    │
          └──────────┬───────────┘    │
                     │                │
          ┌──────────▼───────────┐    │
          │  SVS CONNECTS ITS    │    │
          │  OUTPUT PCM SLOT     │    │
          │                  330 │    │
          └──────────┬───────────┘    │
                     │                │
          ┌──────────▼───────────┐    │
          │  PBX RECOGNIZES      │    │
          │  COMMUNICATION       │    │
          │                  335 │    │
          └──────────┬───────────┘    │
                     │                │
          ┌──────────▼───────────┐    │
          │  PHONE CALL END      │    │
          │  (HANG-UP)       340 │    │
          └──────────┬───────────┘    │
                     │                │
          ┌──────────▼───────────┐    │
          │    PBX IS            │    │
          │  DISCONNECTED        │    │
          │                  345 │    │
          └──────────┬───────────┘    │
                     │                │
                     └────────────────┘
```

FIG. 19

400
VOICE OR DATA
FROM SVS
FLOW CHART

EXECUTE SVS
COMMUNICATIONS
IN PCM FORMAT 405

SVS CONNECTS ITS
OUTPUT PCM SLOT
410

PBX CONNECTS ITS
INPUT PCM SLOT
(CALL ON) 415

PHONE CALL END
420

PBX IS
DISCONNECTED 425

FIG. 20

500

ALARMS FROM
SVS
FLOW CHART

EACH S

```
                    │
                    ▼
        ┌───────────────────────┐
        │ SITE ALARMS ARE       │
        │ SENT THROUGH          │
        │ PCM SLOT        505   │
        └───────────────────────┘
                    │
                    ▼
        ┌───────────────────────┐
        │ SVS SENDS KEY         │
        │ TO FRONT DESK         │
        │ CPU 20  (TO BE        │
        │ RECOGNIZED)     510   │
        └───────────────────────┘
                    │
                    ▼
        ┌───────────────────────┐
        │ SITE SVS SENDS        │
        │ ASTERISK (SYMBOL)     │
        │ TO HEAD END'S         │
        │ MODULE 12       515   │
        └───────────────────────┘
                    │
                    ▼
        ┌───────────────────────┐
        │ CPU 20 RECOGNIZE      │
        │ SVS AND READ THE      │
        │ ALARM NUMBER    520   │
        └───────────────────────┘
                    │
                    ▼
              ◇ IS
           THE ALARM        no
        DISCONNECTED ?
              525
                    │ yes
                    ▼
        ┌───────────────────────┐
        │ READ NEXT EVENT       │
        │                 530   │
        └───────────────────────┘
```

FIG. 21

```
        ┌──────────────────┐
        │       600        │
        │   TEXT / IMAGE   │
        │   FLOW CHART     │
        └──────────────────┘
                 │
        ┌──────────────────────┐
        │ GET CHANNEL FROM     │
        │ TUNER 40        605  │
        └──────────────────────┘
                 │
              ╱     ╲
           ╱    IS     ╲        no
         ╱  THIS A DATA   ╲────────────
         ╲   CHANNEL ?    ╱
           ╲            ╱
              ╲  610  ╱
                 │ yes
        ┌──────────────────────┐
        │ READ IMAGE TYPE      │
        │ AND ITS CONTENT      │
        │ FROM RAM 48     615  │
        └──────────────────────┘
                 │
        ┌──────────────────────┐
        │ MIX HORIZONTAL       │
        │ AND VERTICAL SYNC    │
        │ PULSES WITH IMAGE    │
        │                 620  │
        └──────────────────────┘
                 │
        ┌──────────────────────┐
        │ SEND IMAGE TO TV     │
        │ SET 22          625  │
        └──────────────────────┘
                 │
              ╱     ╲
     yes   ╱          ╲
    ──────╱  NEXT PAGE ? ╲
          ╲             ╱
            ╲  630    ╱
              ╲     ╱
                 │ no
              ╱     ╲
           ╱    IS     ╲        no
         ╱  TUNER 40     ╲────────────
         ╲  SET TO DATA  ╱
         ╲   CHANNEL?    ╱
           ╲          ╱
              ╲ 635 ╱
                 │ yes
        ┌──────────────────────┐
        │ GO TO NEW DATA       │
        │    SCREEN       640  │
        └──────────────────────┘
```